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ABSTRACT

A selection of seven articles on teaching reading to high school students is presented in this report. The topics discussed are: (1) a structured approach to reading expository prose, (2) the effectiveness of sustained silent reading, (3) readability variations in secondary remedial high interest books, (4) the effects of previewing difficult short stories for high school students before assigning them, (5) developing reading rate while maintaining comprehension through speed drills, (6) the effects of varying an advance organizer or schema on student comprehension of abstract material, and (7) using writing samples of students as a means of assessing their reading ability levels. (AEA)

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RESEARCH ON READING IN SECONDARY SCHOOLS

A Semi-Annual Report
Monograph Number 6

Perspectives on Reading Comprehension with Pedagogical and Research Implications

Edited by

Patricia L. Anders

Fall 1980

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PURCHASE OF MONOGRAPH

This monograph is the sixth in a series of semi-annual reports of research related to reading in the secondary schools. This monograph has been funded by the Reading Department of the University of Arizona for the primary purpose of disseminating research findings to professionals in reading who are interested in improving the reading ability of adolescents.

The first three issues of this monograph are available through ERIC; number 1, ED 177-509, number 2, ED 177-510, and number 3, ED 184-052. Issues 4, 5, and 6 are available through the Department of Reading at a cost of $3.50 per monograph. Checks should be made payable to the Reading Research Monograph and forwarded to the University of Arizona, Tucson, Arizona, 85721.

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SUBMISSION OF MANUSCRIPTS

This monograph series is planned and published as a non-profit enterprise by faculty and doctoral students in the Reading Deparment at the University of Arizona. Each article submitted is independently reviewed by at least three members of the editorial board. Subsequent issues are planned that will include specific research studies, theoretical papers that emphasize a need for research, and additional reviews of literature. Articles that deal with any of these areas are being actively solicited if they (1) are of interest to reading professionals on the secondary level, (2) are primarily directed to research, and (3) have not previously been published elsewhere. It is intended that this monograph reflect, not dictate, the trends and interests of reading professionals in secondary education. Please do not hesitate to submit manuscripts which share ideas, research, or experiences that might encourage others to build upon your work and ideas.

One unique aspect of this series is that the editorial board is particularly interested in receiving papers from doctoral students and from assistant professors. It is our belief that many of the professionals in these categories do not publish their research findings because of a perceived and existing difficulty of "breaking into the publishing game." We hope to encourage "first-time" authors by providing such an opportunity and encourage such prospective authors to submit papers or questions to the editors.

The response to our effort has been most gratifying. As you may well appreciate, the production and dissemination of a new publication is hardly an easy task. In fact, as we succeed, the task becomes increasingly more complex. Our future success depends upon the degree to which our colleagues join us in generating research and in reporting their findings.

P.L.A.

ACKNOWLEDGEMENTS

A debt of gratitude is owed Dean Robert F. Paulsen, College of Education, for his continued encouragement in the production of this monograph.

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FROM THE EDITOR

As many of you may know, Joe Vaughan has left the University of Arizona and has accepted the Reading Program Director's position at East Texas State University. He reports that he is very satisfied with his new position and that he is enjoying the challenges.

During the preparation of this, the sixth Research on Reading in Secondary Schools monograph, the following questions intermittently haunted me:

1) who comprises the audience of this monograph?
2) why do people order the monograph?
3) what sort of expectations do subscribers have for this publication?
4) how well are subscribers' expectations being met? and,
5) how could more researchers and educators be encouraged to submit their work to the monograph?

These questions are important because we believe that the work published in this monograph should reflect - not dictate - both the trends in secondary reading and the interests of secondary researchers and educators. With this in mind, I would very much welcome communication with you. I would respond to personal letters, but, in addition, I would like to introduce a section in the monograph entitled "Interchange." Within "Interchange" readers' comments upon the state of secondary reading research, reactions to specific papers, or requests for researchers and educators to address certain research questions are invited. Please write, we need to know more about each other.

Finally, with regard to broadening the base of contributors, I have one very basic suggestion to make to relatively new or first time authors: find a published author to critique your manuscript before you send it to us. It may come as a surprise to novice authors, but even the most experienced of authors usually share their manuscripts with a variety of colleagues before submitting it to a journal. Having input from an experienced writer does not, of course, guarantee publication, but it does greatly increase the odds that the paper will be written in an acceptable and scholarly way.

In conclusion, I would like to offer my personal thanks to all who have, in one way or another, contributed to this and all the previous monographs. The process of creating this monograph is rewarding and gratifying because of the people who are involved. Thank you and I hope to hear from you soon.

Patricia L. Anders

Reading: Going Beyond the Information Given

Harold E. Nugent
Keene State College

Glenna M. Mize
University of Connecticut and
Keene State College

When we ask students to read and evaluate a piece of expository prose, we are asking them to use their knowledge, experience, and language competency to process information. After they finish reading, we usually ask them such global questions as what did you get out of it? or what was the author's purpose? The answers to such questions, written or oral, are often disappointing to both teacher and students. Part of the problem here is that teachers and students often lack an effective approach.

With the help of our students during the past three years, we have developed a systematic procedure which aids the reader in processing the author's material. The Intellectual Framework Analysis (IFA) presented in this article is a structured approach to reading expository prose. Suitable for high school students and college freshmen, the IFA is based on a number of concepts drawn from studies in cognitive psychology by Jerome Bruner (1973) and George Miller (1956) as well as the psycholinguistic reading models of Kenneth Goodman (1967) and Frank Smith (1974). The IFA requires the reader to move between the surface or literal level and the deeper or interpretative levels of meaning of the expository prose.

The dynamics of this interaction as structured in the IFA results in the reader reconstructing and recoding the author's message. Each of these procedures is beneficial. First, the reconstruction of the information requires the reader to rearrange and in some places complete the information given. By doing this, the reader creates a map similar to that used by the

author in his or her cognitive planning. With this map the reader has a guide to both the content and structure of the author's message. Through practice the reader can utilize this framework to predict and verify meaning. This is the process that Kenneth Goodman says will help reduce uncertainty and increase understanding.

Recoding, the second process required by the IFA, aids the reader in remembering the material. As Bruner has pointed out, the problem of memory is not so much one of storage as that of retrieval. The regrouping of bits of information into larger segments results in ease of storage and retrieval. George Miller calls this recoding process, "chunking." In other words, the reader processes and recodes material into larger chunks that incorporate a number of bits of information. Both bits and chunks then become a product of the reader's own cognitive patterning.

In introducing the Intellectual Framework Analysis, we ask the students to read the following advertisement from Time magazine.

"How to Open Your Own BTV Assembly Plant"

> Many of the less industrialized nations of the world are in need of low-cost basic transportation. The owners of small businesses, farms and little factories in those countries often can't afford the cost of the kinds of cars and trucks that the industrialized nations export. So we've developed a Basic Transportation Vehicle that can be made in the less industrialized countries in a plant that costs about $50,000.
>
> The assembly plants are usually owned by the people who live in those countries. We've given them technical assistance at the beginning and then leave them on their own after a few weeks or months.
>
> The automobile body they make has no curved metal, so they can literally cut it out of sheet metal with a "Nipper," a kind of motorized metal shears. It's done in about the same way a dress is cut from a pattern.
>
> We supply the difficult-to-manufacture parts (engine and drive train) from a GM plant in England, and we do it with standard parts so that there aren't any problems about the availability of replacement parts.

The assembly work teaches these skills: welding, sheet-metal working, planting, work layout, quality control, scheduling and ordering, wiring, auto mechanics, carpentry and critical path planning for production.

The BTV is usually the lowest-priced 4-wheel vehicle available in the country and often the first vehicle a person can afford to buy. In some places it costs less than a good horse.

Our design for the manufacture of these vehicles is labor intensive rather than capital intensive, because these countries need work for their people.

All it takes to start a BTV plant is a structure about the size of a large barn, $50,000, and the nation will begin industrializing.

The Basic Transportation Vehicle is being built now in Malaysia, Ecuador, Portugal and the Philippines. With GM assistance people are starting their own assembly plants in other countries in Africa, Latin America and the Middle East.

GM is willing to help people in any country to start up their own BTV assembly plant. We believe it is the moral obligation of industrialized societies to help less industrialized countries get started on the way to a higher standard of living. The BTV is a step in that direction.

Our next step is to ask the global questions: What did you get from it? What is the author's message? Students frantically scurry to find mental templates to match the teacher's. This activity provides a basis for comparing and contrasting questions and answers <u>after</u> the use of the IFA.

We then discuss the psychological base for the IFA as presented above. We give them the IFA overview and discuss each of the sections, referring to the advertisement for examples.

Intellectual Framework Analysis
(An approach to reading non-fiction prose)

I. Subject Matter: (After identifying the material, author, and publication, write one or two sentences stating briefly what the article is about.)

A. Classifications: (How is the material divided? While reading, list the divisions of these main points. In some cases the author may only imply classifications. Therefore, the reader will need to complete the implication. Star the completed implications.)

B. Distinctions: (Go back over classifications and choose those to which the author attaches a value judgment. List these as distinctions and underline those which the author values. Write one or two sentences explaining the author's major preferences.)

C. Definitions: (How does the author define key terms as found under classifications and distinctions?)

II. Techniques of Proof: (How are the author's value judgments supported? Which of the following techniques are used? Write a paragraph citing specific examples related to each category.)

A. Type of Analysis

1. cause-effect
2. comparison-contrast
3. process analysis
4. illustration
5. definition

B. Manner of Reasoning

1. deductive

2. inductive

3. analogy

C. Nature of Examples

1. Facts

a. verified

b. accepted

2. Opinions

a. objective

b. subjective

c. authorities'

d. author's

e. collective

III. Motivation: (What is the author's purpose in writing the article?)

IV. Form to Content: (Comment on the way vocabulary, sentence structure, and general format are used to achieve the author's purpose.)

V. Evaluation: (Write a couple of paragraphs discussing how effective the author is in achieving his/her purpose. Consider first, the general audience for whom the article is written and aimed, and second, how worthwhile you [the reader] consider the work.)

Once the students have an understanding of the topics and questions, we divide them into small groups and ask each group to finish applying the IFA to the article and record the results. Each group then shares the

results and a composite is made by the students or teacher and distributed at the next class meeting. This composite serves as a model for further applications to other expository readings. The students often write their first drafts in a phrase format then progress to a more polished form as represented in the student composite below.

"How to Open Your Own BTV Assembly Plant"
(Time, November 12, 1973. (Advertisement for General Motors)

I. Subject Matter: The author is writing about the advantages of a Basic Transportation Vehicle (BTV). The vehicle is developed by General Motors for manufacture and used in less industrialized nations.

A. Classifications:

1. Transportation

a. low cost

b. high cost*

2. Nations

a. less industrialized

b. industrialized

3. Materials

a. supplied

b. self-made

c. complex

d. non-complex

e. curved metal

g. standard parts

(1) engine

(2) drive train

4. Skills

   a. welding

   b. sheet metal work

   c. painting

   d. work layout

   e. quality control

   f. wiring

   g. scheduling

   h. mechanics

   i. carpentry

   j. critical path planning

5. Owner of Assembly Plant

   a. GMC*

   b. people of the country

6. Location of plants

   a. Malaysia

   b. Ecuador

   c. Portugal

   d. Phillipines

   e. Africa

   f. Latin America

   g. Middle East

B. Distinctions:

1. low cost transportation vs. high cost transportation*
2. less industrialized nations vs. industrialized nations
3. labor intensive vs. capital intensive
4. flat metal vs. curved metal
5. low standard of living vs. higher standard of living
6. plants owned by people vs. plants owned by GMC*

In developing the advantages of the BTV, the author prefers the above underlined distinctions. The major valued distinctions appear to be low cost transportation and industrialized nations. Most other distinctions can be subordinated to one of these two. For example, flat metal under low cost transportation and higher standard of living under industrialized nation. The starred items had to be constructed since they were not in the article itself.

C. Definitions:

1. BTV is a basic transportation vehicle, affordable by general populace in less industrialized nations.
2. Labor intensive is an approach oriented toward providing needed jobs for people in underdeveloped countries.
3. Capital intensive, higher standard of living, and other distinctions are not defined.

II. Techniques of Proof

The major type of analyses utilized here are comparison-contrast and cause-effect. These are backed up with examples both in words and with diagrams/pictures. The contrast of the less industrialized nations with industrialized nations, low cost with high cost transportation as revealed in the major distinctions are treated in terms of their effects. It is

claimed that the effects of manufacturing BTV would be to provide skilled jobs, more industries, and thus a higher standard of living.

The manner of reasoning is deductive with generalizations given initially. An example of this is "less industrialized nations of the world are in need of low cost transportation." Two analogies are used, one comparing the cutting of sheet metal to cutting a cloth from a pattern for a dress and the second comparing the cost of BTV to the cost of a horse.

The nature of examples fall into the category of facts that are presented as generally accepted. Examples of these unverified facts are the need for transportation in less industrialized nations, the plant costs, and the prospective locations of the plants. Much of the argument is based on the author's two basic distinctions. First, the essential need of less industrialized nations is a basic transportation vehicle. Second, the best way to meet this need is through an assembly plant provided with General Motor's "assistance."

III. Motivation:

The author's purpose in writing the advertisement is to show how GMC is willing to help underdeveloped countries. A secondary purpose would be to increase the public relations image of GMC as a company not concerned with profits but with helping the less fortunate.

IV. Form to Content:

The form is characterized by simple words, short sentences, and one or two sentence paragraphs. These are accompanied by simple diagrams and pictures which can be cut out and assembled. Both contribute to the author's point that "all it takes to start a BTV plant is a structure the

size of a large barn, $50,000, and the nation will begin industrializing." The analogies to barn, dress, and horse are uncomplicated and contribute to the author's motivation that GMC has the simple answer to the problem of underdeveloped nations.

V. Evaluation:

The author effectively uses several techniques to achieve his main motivation of showing how his company (GMC) is interested in helping less industrialized nations. In keeping with the purpose, the writer has made both form and content relatively uncomplicated and thus in a short space appeals directly to the reader. The bold title and illustrations involve the reader initially. As a result of these techniques the author successfully accomplishes his purpose.

The related purpose of promoting GMC's image is also an important aspect of the advertisement. GMC's willingness to "give technical assistance" and to supply "difficult-to-manufacture parts" as part of their "moral obligations" is evident. As an article, it is worth analysis as it makes the reader realize the dual levels of motivation at work in the advertisement.

However, the total cost of dependency on GMC's "assistance" is not balanced with adequate techniques of proof. This lack of proof raises the questions on whether the author's valued but undefined distinctions (industrialization, and higher standard of living) are really desirable for these countries.

Once the students have identified the subject matter, they quickly perceive how the author, using his/her linguistic hatchet, classifies and categorizes subject matter into more manageable parts. In doing so, the author imposes a sense of order, a perception of reality, on the material. Readers sensitive to the author's particular way of dissecting the world around him/her will increase both their critical appreciation and understanding of the writing.

Part of the understanding results from the students completing the author's classifications. For example, when the author of the Time article classifies skills, eleven examples are given; thus there is little need for additional classification. However, in classifying transportation the author mentions only one category, low cost transportation. The IFA process here alerts the reader to the missing information. The reader now completes the classification by listing additional information such as high cost, medium cost and so forth. An asterik is placed next to information that is reconstructed by the reader. Other subject matters in the article requiring the reader's completion include assistance, standard of living, and obligation. In sum, this reconstructing of the subject matter encourages the reader, in Bruner's terms, to go "beyond the information given," to discover new information, new connections, and new insights.

Once the classifications have been listed, the students work with the key process, the discovery of distinctions. Distinctions are those classifications to which the author attaches a value judgment. A value judgment can be defined as a preference, as an emphasis, or as a focus on a particular part of the classification of the subject. We ask the students to

list the distinctions in a horizontal format such as low cost transportation vs. high cost transportation* to distinguish them from the list of classifications. When all the distinctions that can be found are listed, the students go back over them and underline those that the author values. In this analysis they see that some distinctions including low and high cost transportation and low and high standard of living appear to be major headings under which subordinate distinctions such as flat metal and labor intensive might be placed.

The processing of distinctions can serve two purposes here. First, a distinction like low cost vs. high cost transportation can provide the large segment of information into which smaller bits of information such as flat and curved metal can be chunked. Secondly, the reader can use the concept of distinction to predict an author's ultimate value judgments. For example, the reader could predict that the author would value industrialized nations over less industrialized nations. The reader can then verify or not verify this predicted value judgment as the reading and analysis progress.

Once the distinctions are separated from the classifications and underlined, the student is asked to locate definitions for the key classifications and distinctions. It is equally important to note when the definitions are not present or are unclear.

Under the section headed techniques of proof, the student is asked to find how the author supported the value judgments for the underlined distinctions. Over a period of a semester, students gradually become more familiar with the three techniques of proof: type of analysis, manner of

reasoning, and nature of examples. By providing concrete examples of each of the techniques of proof in assigned readings, the teacher can acquaint the students with these basic concepts of logic. It is not necessary for students to grasp the finer points of the techniques of proof in order to effectively evaluate the article.

The last three sections of the IFA (Motivation, Form to Content, and Evaluation) are designed to provide students the opportunity to interrelate the preceding questions and answers. We find that the students' response to these three sections reveal quite sophisticated insights into the author's purpose and achievement. (Any one of the questions related to the last three sections, especially those under Evaluation, can be used as basis for writing an extended critical essay.) The above composite gives an indication of the caliber of work students can be expected to achieve at an early stage in the application of the IFA.

Once the students have completed this IFA process, they are more aware of what the reader should expect from the writer. They are also more alert to the process which the proficient reader uses to interpret the author's message. In terms of its relationship to writing, we have found that students who are familiar with the IFA are often more alert to the need to clearly reveal their distinctions, value judgments, and techniques of proof to their reader. Later related essay assignments result in the use of these understandings to produce more perceptive, critical, and readable essays.

We have used the IFA successfully with high school students and with college freshmen. A natural sequence in the development and application

of the IFA includes its use as a directed reading activity; that is, turning the section headings into questions. The student is then looking, as he or she reads, for answers to such questions as: What is the subject matter? How is it classified, divided, defined, and valued? What is the author's motivation? How does form contribute to content? How effectively does the author achieve purpose? Again the answers to the initial sections prepare the reader for responding to the later evaluative questions. Some students have found that with marginal notations of the IFA process as they read, they are well prepared to respond orally and/or in writing to a variety of classroom questions.

In sum, we believe the IFA incorporates a number of those study skills needed in reading and understanding content materials. These skills would include such essential abilities as recognizing structural organization, outlining, logical analysis, propaganda techniques, value clarification, SQ3R, and so forth. In addition, the IFA has the potential to activate competencies in terms of what each reader brings to and takes away from the printed page. Because it both reconstructs and recodes materials, it aids in the storage and retrieval of information, thus facilitating both understanding and remembering. The reader who continuously applies and develops the IFA in his or her reading can truly go "beyond the information given" and more effectively process the product.

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The Effectiveness of Sustained Silent Reading at the Secondary Level

Shelley K. Salaman
William Tennent Senior High School
and the University of Pennsylvania

Sustained Silent Reading has long been advocated as a methodology for motivating reading as a leisure time activity, and in 1977, Pennsylvania adopted it as part of its Comprehensive Language Arts Program. As recommended in this program, SSR involves uninterrupted silent reading for a set time period depending upon the attention span of the group, the use of self-selected books and magazines, the avoidance of assigned follow-up activities such as book reports or tests, and the implementation of voluntary sharing periods (Botel, 1977).

Until very recently there has been a lack of studies of the effectiveness of SSR at the secondary level, but during 1980 several studies have been completed and published. For example, Cline and Kretke (March, 1980) reported the results of a 3 year SSR program implemented in grades 7-9 which assessed the reading attitudes and achievement for a group of students reading on the average of 2 years above grade level. Results were compared to a control group of students who had not received SSR programming, but who were comparable in scholastic achievement and socio-economic background. Cline and Kretke found that there was no significant difference in achievement. However, there was a significant different at the p .05 level between the SSR group and the control group on 4 items out of 12 assessing attitude towards reading in a general attitude inventory written

by the school guidance department. Those items which showed statistically significant differences concerned attitudes toward going to the library, reading a book of choice, reading an assigned book, and the importance of reading.

Second, Sadoski (May, 1980) reported on a program encompassing only 7 forty-five minute periods in a grade 10-12 high school in a lower middle class suburban area. Results were favorable on an attitude survey written by Sadoski. On those questions designed to measure positive change in attitude, students scored at a mean level of 2.58 out of 4 which meant that they perceived the program as "being mid-way between having a little value and having significant value in changing their reading attitudes." On questions designed to measure the specifics of program function, students scored at a mean value of 3.13 indicating that they saw the program as one which operated successfully.

One the other hand, a study done by Minton (March, 1980) on the attitudes of 9th grade students and staff following a semester of 15 minute SSR periods given on a daily basis reported unfavorable results. The school was comprised of students living in a middle income suburban community in California. An attitude questionnaire developed by the teaching staff was given before and after the program. The results showed that only 6% more students thought SSR was an excellent idea, 27% fewer students said they were currently reading a book, 18% more students said they never found themselves talking to each other about a book they'd read, and 15% fewer students said they enjoyed reading. Minton attributed this failure to three factors. First the program was adopted by the Department Chairmen

of the school before the staff had an opportunity to reflect upon it. Second, inadequate in-service was given to the staff to facilitate implementation of the program. Third, the entire school was forced to participate at one time, thereby involving students in inappropriate settings such as gym and shop classes.

This article reports a study done at William Tennent Senior High School in Warminster, Pennsylvania during the 1979-1980 school year. The results of this study supports the positive results of the two successful studies done by Cline and Kretke and Sadoska.

Initially the SSR program at WTSHS was begun during the Spring semester of 1979 under the direction of the vice-principal and the reading supervisor. They presented it first to two committees organized by the vice-principal, one of interested faculty and the other of interested pupils. These committees, in turn, presented the idea to the rest of the faculty and to the student body, and were vital in gaining the support of both the faculty and the student body. The program was presented as a suggestion, and faculty and students were involved in formulating the final program operation. It was decided to operate the program twice a week for 20 minute periods during which time the entire school of 2200 students, the entire faculty, administrative staff, and all supporting employees were to read. After the 20 minute period, further reading time was voluntary. Scheduling was implemented on a rotational basis of two set days so that the same class period would not be affected each time. The school library budgeted $500 to buy paperback books and magazines for classrooms so that those pupils who failed to bring in their own reading

material would have materials readily available. Additional materials were donated by the community. At the end of the semester, it was decided that the program had been such a success that it was scheduled for operation during the 1979-1980 school year.

Procedures

The 1979-1980 SSR program is the subject of this investigation. For this study, 135 students from grades 11 and 12 were selected from WTSHS and 76 students were selected from a neighboring district in Lower Bucks County to serve as a control group. In the control, school students had taken part in SSR programming in the 7th and 8th grade but had no experience with it since that time. In WTSHS, 6 teachers in all subject areas were selected by the vice-principal to participate in the study. From their classes of high, average, and below average pupils, 135 students were picked at random. For the control group, the Department Chairman of English selected one high, one average, and one below average English class for testing. To ascertain comparability between the two groups, it was found that both groups had taken the Comprehensive Test of Basic Skills in the 10th grade and a comparison was made of the mean scores in reading achievement and reading aptitude. (It was necessary to use the mean scores of the total class rather than just the group involved in the study, since the control school wished to maintain the privacy of records for the students involved.)

These are the results:

WTSHS		
11th	Achievement Score	11.2
grade	Anticipated Score	11.8
12th	Achievement Score	11.1
grade	Anticipated Score	12.0
Control School		
11th	Achievement Score	12.6
grade	Anticipated Score	12.2
12th	Achievement Score	12.4
grade	Anticipated Score	12.0

It can be seen from these scores that the achievement of the control school was approximately one year's reading grade level higher than the achievement of the classes at WTSHS. From looking at the anticipated scores, it can be seen that there was no significant difference in aptitude for reading achievement between the two groups.

To assess reading attitude, an instrument developed by Estes (1971) was chosen. This instrument was field tested and found to have a .96 reliability quotient. It was further validated in a study done by Dulin and Chester (1974). The survey was given as a pre-test in September and as a post-test in January after 4 months of SSR at WTSHS. It was necessary to administer the post-test in January because in the control school,

English classes change in mid-semester, and the same groups of students would not be easily accessible.

Results

In order to understand the results, the scoring system of the Estes Attitude Survey must be explained. A score of 60 on the instrument indicates a neutral attitude. Anything above 60 towards 100 indicates a positive attitude, and anything below 60 suggests a negative attitude. The results were as follows:

WTSHS

September Mean: 73.52

January Mean: 76.19

z test = .3 No significant differences

It is interesting to note that the standard error of the mean for WTSHS scores was .4795 which indicates that there was not a great deal of deviation in the scores. In contrast, the standard error of the mean for the scores from the control school was 2.90 which indicates greater deviation.

Discussion

The results of this study indicate that for this population, Sustained Silent Reading had a very positive effect as a motivational tool. The mean score rose 2.67 points in 4 months time achieving significance at less than the .01 level, and of additional importance is the fact that in the control school the mean dropped by .87 of a point. The success of the results at WTSHS replicates the successful studies done by Cline and Kretke in a grade 7-9 setting and by Sadoski in a grade 10-12 setting, and therefore, lends further credence to the motivational effectiveness of SSR. As in the

study done by Cline and Kretke, the students involved are better students, in that at WTSHS the mean score for reading achievement in 10th grade was approximately one year above reading grade level, and in the control school the mean score was two years above level. It is important to note, however, that a breakdown of achievement levels showed that at WTSHS the below average pupils who read below grade level showed the greatest changes in attitude moving from a September mean of 62.7 to a January mean of 67.0. The success of our study combined with knowledge of other successful studies indicates that SSR has a place in the secondary schools. As implied by the slight decline of scores in the control school, it may be inferred that achieving adolescents lose interest in reading as a leisure-time activity. The value of SSR then not only appears to reverse a decline in attitude amongst adolescents, but can lead to positive changes in attitude.

Minton believed that the study done amongst 9th grade students (1980), which failed, did so in part due to inadequate faculty preparation and poor introduction. It can be seen that at WTSHS great care was taken to win faculty and student support before the program was introduced. Also to alleviate another problem mentioned by Minton, that of reading in inappropriate settings, abundant reading materials were supplied to these areas by the library and reading staff.

A possible problem which existed in this study involved the administration of the attitude survey. Classroom teachers administered the instrument rather than the author of the study and it may be possible that the teachers at WTSHS, because they were more involved in the program,

administered this survey with more seriousness than did the teachers at the control school. Also, it was only possible to obtain 76 control students, whereas at WTSHS, 135 students were used. In both schools, the student population consists of approximately 2,000 pupils.

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Readability Variations Within Secondary Remedial High-Interest Books

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Secondary level remedial reading students have special instructional needs because of their academic histories. The typical remedial student is far behind grade level in reading achievement, possibly as many as eight or nine years behind. The usual pattern followed is that the remedial student first encounters difficulty learning to read years earlier, often in the primary grades. It is very likely that such a student has experienced years and years of failure and frustration related to reading. As a consequence, the high school reading teacher often has to deal with students with negative and even hostile attitudes concerning reading.

The negative feelings of remedial students about reading built up through many years of failure are hard to extinguish. However, their negative attitudes can slowly be replaced with positive attitudes if remedial students are given many opportunities to read with success. Success while reading is most probable if easy-to-read materials of interest and relevancy are used. Therefore, it is imperative that interesting reading materials of <u>appropriate readability</u> be selected for use with remedial students.

There are a number of published high school remedial programs now available which are purported to be of high-interest and low difficulty.

An inspection of these materials reveals that many have contents that should be interesting to secondary level students. However, aside from a grade designation (which may or may not have been determined through the use of a readability formula) publishers of high school remedial materials reveal little else about the readability properties of their books. To the knowledge of the investigators, very few publishers of such materials provide useful information concerning intrabook readability variation or the readability properties of stories within remedial books.

While no study has been made of the readability properties of secondary level remedial books, there is some evidence now available with other reading materials which shows that substantial intrabook readability variation exists and that it does affect student performance.

Several recently reported studies have investigated the population readability properties of various kinds of reading materials. The entire contents of basal series readers (Bradley and Ames, 1977), basal series workbooks (Fitzgerald, 1980), adolescent literature (Ames and Bradley, 1979) and a junior high school social studies text (Ames and Bradley, n.d.) were measured for readability with the Fry Graph (Fry, 1968). With all types of materials studied, substantial intrabook readability variation (ranges spanning seven to thirteen grades) were found. In addition, it was found that the books studied consisted of a jumble of readability levels rather than any clear progression of difficulty. Books containing chapters or stories showed substantial readability differences from story to story or chapter to chapter with no discernible pattern of intrabook story or chapter difficulty.

Intrabook readability variation has been found to be related to reading performance. The investigators constructed an oral reading test by using the Fry Readability Formula (1968) to scale twelve reading passages in consecutive difficulty from first grade through twelfth grade. Their test was similar to others commonly used to establish instructional placement except for one major difference: all twelve test passages were taken from the same book, a fourth reader. The test was administered to determine the functional reading levels of 51 intermediate grade students who were then being instructed at a fourth reader level. The findings of this study revealed that it is possible for students to perform at levels indicative of independence, instruction and frustration on reading passages from the same book. These findings suggest that there is no such thing as an instructional reading level for a book.

Given the importance of providing remedial high school students with successful reading experiences, a study of the readability parameters of several high-interest, low-vocabulary books was conducted. If secondary level remedial books are similar to other kinds of materials, intrabook readability variation is possible. If readability variation is present within secondary level remedial books, parameter data could be put to good use improving the effectiveness and efficiency of remedial instruction. If information were available concerning the readability of remedial book stories and selections, pedagogical adjustments could be made to increase the probability of success despite the presence of intrabook readability variation.

It is commonly accepted that the foundation of a developmental reading program rests on the construction and use of valid placement instruments. This requirement is even more important for remedial programs, because of the real need to insure that remedial students have successful experiences while reading. If parameter readability data concerning remedial books were available, such information should contribute to the construction of better placement tests.

Because it is usually not practical to spend the time to determine parameter readability values of whole books, such information may be estimated by the use of a sample set of adequate size. Bradley and Ames (1977) found a need for a set of at least 24 samples in order to accurately estimate the actual parameter readability values of basal readers. No research of this type has been done with high school remedial books.

Method

The readability of eleven secondary level remedial reading books was investigated. Seven of the books came from the Breakthrough Series published by Allyn and Bacon (Wheelock & Sheldon, 1969a, 1969b, 1973a, 1973b, 1973c; Woessner, Wheelock & Sheldon, 1971a, 1971b). Two other books were selected from the Contact Series published by Scholastic Books (Breuer, 1974; Mohrmann, 1974); and the remaining two were from the Impact Series published by Holt, Rinehart and Winston (Stull & Brooks, 1968a, 1968b). All three series are intended for use with disabled readers at the secondary school level.

The Fry Readability Formula (Fry, 1968) was used to measure the difficulty of the eleven books selected for study. The Fry Readability

Formula was selected because of its wide use, its simplicity, and its well-established validity as a measure of readability (Fry, 1977; Klare, 1974-75).

The following procedures were used to establish the parameter readability values of the books studied. Each book was treated as a series of 100-word samples rather than a single sample. Fry's directions (Fry, 1968) were followed to count words, sentences, and syllables. Starting with the first word in each story in a book, consecutive 100-word samples were identified until the end of the story was reached. At the end of each of the stories there were usually less than 100 words remaining. Rather than having one sample consist of parts of two stories, these remaining words at the end of each story were ignored, and the count began again with the first word of the next following story. These guidelines were followed throughout each entire book.

There were two types of material which were not measured for readability. Because of some concern about the validity of the Fry Readability Formula with such material, any poems and plays appearing in the books were omitted from the analysis.

For each book studied, a parameter Fry readability score was plotted and parameter readability variation values were obtained. A book's parameter Fry readability score was determined in accordance with Fry's rules. Averages of a book's total syllable and total sentence counts were computed and used to plot a parameter score on the Fry readability graph. A book's internal readability variation was established by plotting a Fry readability estimate for every 100-word sample in the book and then computing the percentage of samples found at each readability level.

Findings

Table 1 presents population readability values obtained with the Fry Readability Formula for the eleven secondary remedial books studied.

Six of the Breakthrough Series books had a definite reading level designation provided by the publisher. The Fry parameter book scores obtained with these six books agreed with the publisher's grade designations in two cases. For the other four books, the obtained Fry parameter scores were one or two levels below the publisher's grade designation.

One of the books in the Breakthrough Series, the two Impact Series books and the two Contact Series books had several reading levels of difficulty designated by their respective publishers. For these five books, the Fry parameter book scores were either within the designated ranges or below.

Insert Table 1 about here

The extent of readability variation within the eleven books can also be seen from an inspection of the data in Table 1. Some of the books differed greatly from one another in terms of extent of readability variation. The book The Time is Now ranged only four levels in readability while at the other extreme, the book Communication extended across eleven levels. Eight of the eleven books exhibited internal readability variation which ranged from six to nine grade levels.

Because the avoidance of failure is of particular concern to teachers working with high school remedial students, the percentage of content likely to cause frustration was identified in each book studied. It is

reasonable to assume that teachers of remedial students are likely to try to match the grade designations of their materials with the assessed instructional reading levels of their students. Given the above situation, portions of books having measured readability levels above their respective grade designations could possibly produce student frustration. Therefore, the investigators computed the percent of samples within each of the eleven books which had Fry readability scores above that book's grade designation.

Some content of all eleven books was found to have measured readability in excess of grade designation. In some cases, the magnitude of this problem was substantial. In the books With It, Communication, Beyond The Block-2, The Time is Now and Cities, the percent of content with measured readability above grade designation was found to be 37, 28, 23, and 19 respectively. In contast, the other six books had six to twelve percent of content higher in readability than grade designation.

Story Data

A study was made of the parameter readability of all stories within the eleven remedial books. Procedures used to compute story readability scores were the same as those previously described used to determine book readability scores.

The analysis revealed that the difference between the least difficult story and the most difficulty story within five of the six books in the Breakthrough Series books (Beyond The Block-2) and the four books studied of the other two series exhibited much greater intra-book readability

variation. Stories in those five books ranged as much as six reading levels in difficulty.

Within all of the eleven books studied, the data clearly showed the lack of any systematic progression of story difficulty. This condition was most apparent in those books which had several reading levels of difficulty designated by their respective publishers. It appears that teachers can not automatically assume that a book designated a multi-level by a publisher will have the easier selections at the beginning of the book and the most difficult stories at the end.

Table 2 is provided to illustrate these story readability findings. The data regarding the book, Communication, dramatically illustrates the lack of any systematic progression of difficulty. The most difficult selection was the first selection in the book, and the least difficult selection was the last. To make matters worse, the Fry parameter score for the first story in Communication exceeded its range of difficulty as designated by the publisher.

Insert Table 2 about here

Sampling Data

Six of the eleven books studied were also used to provide further data regarding the question of the number of samples needed to provide an accurate estimate of a book's actual parameter values.

The following sampling procedures were used separately for each of the six books. Sets containing 3, 6, 9, 12, 15, 18, 21, and 24 samples were studied. Samples were randomly drawn using an equal distribution

method. Every 100-word sample in a book was assigned a number and a table of random numbers was used to determine the first sample drawn. Then the remaining samples evenly distributed within the book were drawn. This procedure was followed five times for each of the eight set sizes used.

The results of this sampling study revealed no clear answer concerning the appropriate number of 100-word passages needed to provide an accurate estimate of book difficulty. It does appear from these data that Fry's (1968) suggestion of three 100-word samples to estimate book difficulty is suspect. For one book (Beyond The Block-2) nine samples consistently yielded Fry estimates which were in agreement with parameter values. In contrast, adequate sample set - parameter agreement was never obtained with two other books (Cities and Larger Than Life) even with the largest sample set size studied. With the remaining three books, consistent agreement was obtained with sets ranging in size from 15 to 21 samples.

Discussion

The conclusions and implications of this study should be considered in view of the following limitations: (a) parts of only three of the many available high-interest low-vocabulary remedial series were investigated; (b) the Fry Readability Formula, only one of many available readability measures, was used to evaluate the difficulty of the books studied.

Because substantial readability variation was obtained with most of the secondary school remedial books studied, it is suggested that those constructing placement tests consider this factor. If great intra-book variability in readability exists, it is possible to have a student

placed at an instructional level in terms of a book's average readability but still have him/her encounter difficulty in his/her attempts to read substantial portions of the book.

Substantial intrabook story difficulty differences following no particular pattern were found with most of the books studied. Often the most difficult selections appeared near the front of the books. To increase the probability of having remedial students experience success with such materials, publishers should report readability information concerning stories within remedial books together with relevant suggestions concerning instruction.

The sampling study revealed that the sample size needed to provide an accurate estimate of a book's parameter readability value varied considerably from book to book. While the number of samples needed is not clear from the data of this study, it does appear warranted to use more samples than three, the number suggested by Fry (1968, 1977).

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Table 1

Fry Parameter Scores and Percent of Samples by Fry Readability Level for Several Secondary Level Remedial Books

Book by Publisher	Number of 100 Word Samples	Publisher's Designated Reading Level	Fry Parameter Scores	Percent of Samples at each Fry Readability Level									
				1	2	3	4	5	6	7	8	9	10-11
Scholastic													
This Land is Our Land	115	4-6	3	13.0	12.2	23.5	14.8	8.7	15.7	7.8	2.6	1.7	
Communication	81	4-6	4	7.4	21.0	22.2	8.6	2.5	9.9	17.3	3.7	3.7	3.7
Holt, Rinehart and Winston													
Cities	236	4-6	3	9.7	11.9	22.6	11.0	9.7	16.5	11.9	2.1	3.8	.8
Larger Than Life	263	4-6	4	3.0	13.7	21.7	14.1	11.8	23.9	8.4	1.1	2.3	
Allyn and Bacon													
The Time is Now	91	2	2	41.7	37.4	17.6	3.3						
With It	99	2	2	22.5	40.8	30.6	4.1	1.0	1.0				
Over the Edge	101	3-4	2	24.8	38.5	19.8	10.9	3.0	3.0				
Where It's At	149	4	2	24.2	29.5	33.6	6.0	4.0	2.0	.7			
Out of Sight	148	4	3	12.8	27.0	34.5	16.2	6.8	2.7				
Beyond the Block-1	144	4	2	30.6	32.6	22.2	9.7	3.5	1.4				
Beyond the Block-2	217	4	3	4.6	29.5	29.5	13.4	7.8	8.8	6.4		.4	

Note: Because of rounding rows may not add to 100 percent.

Table 2

Fry Readability Means and Ranges for Selections from Several Secondary Level Remedial Books

Selection Title by Book	Number of 100 Word Samples	Fry Readability	
		Parameter Score	Range
Where It's At (Allyn and Bacon)			
A Special Kind of Courage	11	3	2-4
God Bless the Child	10	2	1-4
Ebony Killer	13	2	1-5
The Whopper	8	2	1-3
Sister Lou	10	3	1-6
Jet Ace	10	2	1-3
The Market in Aliens	8	3	1-6
Communication (Scholastic)			
How Did Language Begin?	8	7	6-11
How Raven Helped the Ancient People	3	4	4-5
Thank You, Ma'm	11	3	1-6
Washoe	5	6	1-8
Point of Departure	19	2	1-4
Larger Than Life (Holt, Rinehart and Winston)			
The Town Musicians	9	6	4-6
The Fire on the Mountain	12	5	2-7
Chick, Chick, Halfchick	13	3	1-7
King of the Whole Wideworld	3	4	3-5
Joe Magarac, Pittsburgh Steel Man	32	6	2-9
The Giant Ogre, Kloo-Teekl	41	4	2-7
The Place of the Gods	51	3	1-6

Note: Stories are listed in order of presentation within books.

Effects of Previewing Difficult Short Stories for High School Students[1]

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For several years now our group at the University of Minnesota has been attempting to describe and validate specific teaching procedures that teachers can use to facilitate their students' comprehension of the materials they read. One recent paper (Graves, 1979) explains the general plan of the work we are doing; another (Graves & Bender, 1980) reports the results of a study in which the potentially difficult vocabulary in a selection was taught to students before they read the selection; and a third (Graves & Clark, in press) reports the results of a study in which questions were inserted in a selection in such a way that students answered them as they read the selection rather than after they had completed it. The present paper describes another study in the series. More specifically, it describes a study which investigated the use of previews given to senior high school students before they read fairly difficult short stories.

As considered here, a preview consists of introductory material presented to students before they read a specific selection. A preview attempts to build background information pertaining to a selection and to provide specific information about the contents of the reading material itself. A preview for fiction usually includes details of key elements in the selection, such as plot, characters, point of view, tone, setting,

and perhaps theme. A preview might also include definitions of difficult vocabulary, translations of foreign phrases, or a brief introduction of a difficult concept.

Although we have previously recommended that teachers use previews (Graves, Palmer, & Furniss, 1976), we know of no published literature in which their effects have been empirically validated. There are, however, several theories which seem to support their use. First, Ausubel's claim for the efficacy of advance organizers is applicable because previews are somewhat similar to advance organizers. According to Ausubel (1978) advance organizers are "introductory material at a higher level of abstraction, generality, and inclusiveness than the learning passage itself" (P. 252). Ausubel (1960) hypothesized that cognitive structure "is hierarchically organized in terms of highly inclusive concepts under which are subsumed less inclusive subconcepts and informational data" (p. 267). Furthermore, he hypothesized that potentially meaningful material is learned by a student in relation to his or her existing background of relevant concepts, principles, and information, which provide a framework for the reception of new material (1963, p. 76). Teachers can use an appropriate advance organizer before students read a selection in order to provide students with a framework for the new material, allowing students to more easily read the selection and comprehend it. Previews, like advance organizers, attempt to build background information, thereby providing a framework for the new material. However, previews are different from advance organizers in that they provide specific information about a selection in addition to information written at higher levels of abstraction.

Further support for the use of previews is found in recent models of the reading and learning process (Rumelhart & Ortony, 1977; Smith, 1978; Van Dijk, 1977). Like Ausubel's theory, these models emphasize that learning occurs in relation to students' existing knowledge. Smith (1978) employs the terms "nonvisual information," "long-term memory," and "prior knowledge." He uses these as alternate terms for describing cognitive structure, or "the theory of the world in the brain that is the source of all comprehension" (p. 67). Rumelhart and Ortony (1977) employ the term "schemata," which they define as "data structures for representing the generic concepts stored in memory" (p. 101), and Van Dijk (1977) uses the term "frame," which has a similar meaning. Previews, according to these models, aid students in using -- or building -- "prior knowledge," "schemata," or "frames," and using such prior knowledge aids students in comprehending and remembering what they read.

Finally, support for previews is also provided by Smith's (1978) description of a condition known as "tunnel vision." According to Smith, students encounter difficulty in reading when they try to attend to too much visual information at once. Readers are not able to process information at various levels simultaneously. If students are required to decode difficult words, figure out the meanings of new words, and attend to other new or difficult elements in the material at the same time, information overload will result. Information overload causes tunnel vision -- the tendency to focus on small parts rather than the whole -- and reading with comprehension becomes impossible. Smith states that all readers can be afflicted with tunnel vision when they read material that is unfamiliar

or difficult. A preview, by providing specific information from the text to be read, makes unfamiliar material somewhat familiar. Students who receive a preview have seen the information or have heard it before encountering it in the text itself. Thus, previews can reduce the occurrence of tunnel vision by reducing the amount of new information students need to process as they read.

There are, then, several reasons why previews should work. The present study attempted to determine just how well they do work. Additionally, the present study investigated students' attitudes toward previews.

Method

This section of the paper describes the students who took part in the study, the materials used, the procedures we used, and the variables investigated and analysis used.

Students Participating in the Study

The students who took part in the study were 92 eleventh grade students in four English classes of a public high school located in a middle-class suburb of Minneapolis. The four English classes were offering a nine-week mystery elective course. Thus, the students were enrolled in the classes by choice, and the classes contained students of varying levels of ability.

Materials Used

Materials used were two mysteries, a preview for each mystery, a test for each mystery, and a questionnaire.

One mystery was "Murder at the Automat" by Cornell Woolrich, and the other was "The Chocolate Box" by Agatha Christie. "Murder at the Automat" is about 7,600 words long, and "The Chocolate Box" is about 5,100 words long. Although both mysteries are written at the seventh grade level according to the Fry Graph (1977), they were written for competent, mature readers. The mysteries were assigned readings for the classes, and both were printed in an anthology of mystery stories which was being used as the main text for the course. Throughout the nine weeks of the course, a total of 18 mysteries from the anthology were assigned, and, on the whole, the students had been complaining that the reading was difficult. The mysteries were lengthy; the story lines were complicated; and several of them contained foreign settings, characters with difficult foreign names, and foreign phrases.

Each preview began with the title of the mystery and the author. In addition, the previews presented several other types of information. First, an introductory paragraph attempted to provide a link between the mystery and the students' lives. Second, historical background important to understanding the mystery was briefly described. Third, specific details of the setting, characters, point of view, and plot were given. Details of the setting included when and where the mystery occurred as well as an explanation of the importance of the setting to the mystery. Details of characters included naming, identifying, and briefly describing each of the characters. The point of view was specified, and the students were told who was narrating the mystery. Details of the plot included a description of major events up to the point of the climax. Fourth, diffi-

cult words were defined and foreign phrases were translated. Finally, a statement designed to motivate the students to try to solve the mystery as they read was made. Each of the previews was about 600 words long.

The tests each consisted of 18 four-option, multiple-choice questions. Six of these were factual and answered in the preview; six were factual but not answered in the preview; and six were inferential and not answered in the preview.

The questionnaire consisted of eight questions which attempted to gather information on students' responses to receiving the previews. Seven of the questions were statements in the form of a Likert scale, with five possible categories for reaction -- Strongly Disagree, Disagree, Undecided, Agree, and Strongly Agree. The last item was a short answer question, which asked students what they would like to be told about a story before reading it.

Procedures

The study required seven blocks of time -- three for "Murder at the Automat," three for "The Chocolate Box," and one for the questionnaire. Three days from two weeks and one day from a third week were required. The treatments for each story required two full 60-minute class periods for presenting the preview and reading the mystery, as well as part of a third class period for administering the test. The treatment for "Murder at the Automat" was administered during the first three days of week one of the study, and that for "The Chocolate Box" was administered during the first three days of week two of the study. The questionnaire required

one 15-minute block of time and was given to a subset of 24 of the students two weeks after they had completed the stories and the tests.

The treatments were administered to the students in their regular classroom by their teacher. Each student received a preview for one of the stories and no preview for the other story. When administering the preview treatments, the teacher told the students that he was going to give them a preview to the story after which they were to read the story and take a test. The teacher read the preview to the students and also listed on the board the characters in each story and a statement to identify each character. When administering the preview treatment for "The Chocolate Box," the teacher also listed the French phrases from the story and their English translations on the board. The students then had the rest of that class period and the class period the following day to read the story silently. The students took the test the day after reading was completed. When administering the no-preview treatment, the teacher simply told the students they were to read the story and take a test. The students in the no-preview treatment also had two class periods, one on each of two consecutive days, to complete the reading and then took the test on the third day. If the students in either treatment completed the reading early, they were allowed to work on a class project.

Variables and Analysis

The independent variables analyzed in the study were treatment with two levels (preview, no preview) and question type with three levels (factual questions answered in the preview, factual questions not answered

in the preview, inferential questions). The dependent measures used to access students' comprehension were scores on each of the three types of questions. These results were analyzed using the analysis of variance procedure. As already noted, in addition to assessing the cognitive effects of previews, we assessed students' attitudes towards previews using an eight-item questionnaire. Results with the questionnaire were simply tallied.

Results and Discussion

For convenience, all results are shown as percentages. The percentages of correct responses with each of the treatments and for each of the question types are shown in Table 1. As can be seen, students who

Insert Table 1 about here

received the previews produced more correct responses than those who didn't, and students did better on the factual questions that could be answered from the preview than on either of the other types of questions. The analysis of variance indicated that both of these differences were statistically significant ($p < .01$). However, the analysis also revealed a significant interaction between treatment and question type. The cell means for this interaction are shown in Table 2. As can be seen from the

Insert Table 2 about here

table, having the preview aided students with each type of question. However, having the preview aided them most with inferential questions.

Without the preview students scored only 62% on inferential questions as opposed to an average of 72% on both types of factual questions. With the preview, students scored 74% on inferential questions as opposed to an average of 76% on both types of factual questions.

The results with the questionnaire were similarly positive. The seven-item Likert scale and students' responses to each item are shown in Table 3. As can be seen from the table, results for question one were that 92% of the students felt that the preview helped them read and under-

Insert Table 3 about here

stand the story. For question two, 92% felt that having the characters listed on the board helped them read and understand the story. For question three, 74% felt that having French phrases listed on the board helped them read and understand "The Chocolate Box." For question four, 70% felt that the preview made reading the story more enjoyable. For question five, 96% felt that the preview did not give away too much of the story. For question six, 87% felt that the preview did not make reading the story boring. Finally, for question seven, 91% felt that previews should be given before most difficult stories.

The short answer question on the questionnaire was "What kinds of information do you think students should be given about a story before they read it?" As would be expected, the students wrote a number of different responses to the question, but suggestions common to many of them appeared. For example, 16 students wrote that they would like characters of stories to be introduced. Seven of the students wrote that they would like the

setting described. Seven wrote that a preview like the one they had received should be given before stories. Six students wrote that they would like the plot described (although three of these cautioned that the ending of the story should not be given away before they read it). Finally, five students wrote that they would like difficult words explained.

The results of the study can be briefly summarized. The previews aided students in dealing with both factual and inferential questions and were particularly facilitative for inferential questions. Moreover, the vast majority of students responded very positively to being given the previews and indicated that previews should be given before most difficult stories.

In general, then, previews appear to be useful and well received by senior high students. Additionally, some of our previous work (Graves & Palmer, 1980) and work in progress (Cooke, in preparation) indicates that previews can also be effective with upper elementary and junior high students. We therefore believe that previews can be effective with students of various ages, and we believe that they should be used fairly frequently when students are given difficult material to read. At the same time, we don't want to suggest that previews should be used all of the time. We seriously doubt that anything should be used all of the time. Students sometimes need to read selections that are unfamiliar and challenging as well as ones that are more familiar and less challenging. Also, of course, students need diversity. But previews can be very helpful when used at appropriate times.

In conclusion, we would like to say something about the contents of effective previews. We have described the previews used in the study in some detail, and we are currently attempting to describe the general structure of previews and the kind of information that previews might contain (Cooke, in preparation). However, just exactly what will work in a particular situation depends on the material to be read and the students who will read it. Thus, teachers need to realize that previews can be effective teaching aids, and they need to know the various sorts of information that previews can contain. Beyond this, however, they need to know their students and the materials they're reading, and they need to construct previews that will work for those students reading those selections.

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Footnote

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Table 1

Percentages of Correct Responses

for Each Treatment and Question Type

Treatment	Preview 75%		No Preview 69%
Question Type	Factual Questions In Preview 80%	Factual Questions Not In Preview 68%	Inferential Questions 68%

Table 2

Percentages of Correct Responses

for Treatment x Question Type Interaction

Question Type	Treatment	
	Preview	No Preview
Factual Questions in Previews	82%	77%
Factual Questions Not in Previews	70%	67%
Inferential Questions	74%	62%

Table 3

Questionnaire Items

SD = Strongly Disagree, D = Disagree, U = Undecided,

A = Agree, SA = Strongly Agree

	SD	D	U	A	SA
1. The preview helped me read and understand the story.	____	____	8%	54%	38%
2. Having the characters listed on the board helped me read and understand the story.	____	____	8%	46%	46%
3. Having the French phrases listed on the board helped me read and understand the story. (Answer this only if you got the preview with "The Chocolate Box.")	____	13%	13%	57%	17%
4. The preview made reading the story more enjoyable.	____	13%	17%	48%	22%
5. The preview gave away too much of the story.	32%	64%	____	4%	____
6. The preview made reading the story boring.	30%	57%	13%	____	____
7. Previews should be given before most difficult stories.	____	____	9%	61%	30%

Developing Rate Through Speed Drills

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Harris and Sipay (1975) suggested that today's literate adults probably go through more reading material in a week than their great grandfathers did in a year. Since the invention of the printing press the dissemination of information has increased tremendously. During the past three decades, the spread of information has increased at an astounding rate (Toffler, 1970). Consequently, the amount of reading necessary for college students keeps growing to keep them abreast of happenings in their various areas of interest. To illustrate this point, Toffler cited biochemist Philip Sickevitz who suggested that "what has been learned in the last three decades about the nature of living beings dwarfs in extent of knowledge any comparable period of scientific discovery in the history of mankind."

As suggested above, college students must competently read large amounts of printed material even to meet minimum requirements for most courses. Unfortunately, many college students read so slowly that reading all material essential for course work becomes an almost impossible task. In order to succeed, such students must not only develop greater speed but also the ability to vary rate so that they can read at the fastest possible rate which permits the desired level of comprehension. Despite the need to vary rate, an extensive review of research led McDonald (1965) to conclude that in high school and often through college few students develop flexibility in reading rate.

Robinson (1979) concluded that under normal circumstances students can be expected to read easier material more rapidly than more difficult material; however, a substantial number of students get locked into one rate for all materials and all purposes. Robinson pointed out that some students habitually read rapidly; however, students who are in apparent need of increasing reading rate are of primary concern in this study since they seem to be in far greater numbers than their rapid reading counterparts.

Relative to increasing reading rate, Harris and Sipay (1975) reported that there is much evidence that typical high school or college students are capable of increasing reading rates by 25 to 50 percent while there is no decline in comprehension. Harris and Sipay further suggested that some very slow readers can increase their rates by 100 percent with no decline in comprehension.

With increasing rate in mind, an approach called Developing Rate Through Speed Drills (DRSD) was introduced in an elective Reading Improvement Class at East Tennessee State University. Data will be presented following a description of the DRSD procedures.

Developing Rate Through Speed Drills (DRSD)

The DRSD method was introduced and implemented through the following procedures:

1. A series of texts was selected with numerous passages of the same length which were arranged so that students could work with material that could be gradually increased in difficulty. Timed Readings (Spargo &

Williston, 1975) were used initially. These texts contain 400 word passages ranging from approximately fifth grade through college in level of difficulty.

2. Students started with either the ninth or tenth grade level material with which it was anticipated they would encounter very little difficulty with either word recognition or comprehension.

3. The students then read a selection at their normal reading rate and then recorded the time required for reading. Comprehension questions were then answered without looking back at the selection. Rate in words per minute was then recorded having been determined from a chart in the back of the text. See Appendix One.

4. Another selection of the same approximate level of difficulty was read, but this time the reader was allowed only one minute for reading. Consequently, the material had to be covered at a rate of 400 words per minute. Comprehension was evaluated and the percent correct and rate in words per minute were recorded.

5. Still another selection was read, but students were allowed only 45 seconds to cover the material. This is a rate of 600 words per minute. (Concerning rapid rate, Pauk (1975) proposed that because of physical limitations in eye movement, reading at speeds approaching 600 words per minute necessarily involves some skimming. Consequently, in this context material "read", no doubt, includes some skimming.)

6. A fourth selection was read with the readers allowed only 30 seconds to cover the material (800 words per minute.)

Variations on this phase of DRSD included adding a fifth selection to be read freely after which rate and comprehension data was recorded and/or having students answer a set of comprehension questions for a selection that had not been read at all. This latter variation, in addition to providing a lighter touch, demonstrates to the students that they sometimes know a considerable amount about a topic before reading. Further, this type of exercise helps to determine whether material is too easy and whether it would be advisable to move on to more difficult material. Overall, rapid reading of the 400 word selections demonstrates to most students in a dramatic way that they can read faster.

The next phase of DRSD involving the use of longer selections was implemented. Articles of 1350 words from Developing Reading Efficiency (Miller, 1972) and Increasing Reading Efficiency (Miller, 1970) were used. According to the author, these selections range in difficulty from junior high school through a level appropriate to test the competence of college graduates. The students seemed to have no difficulty in moving from the four hundred word to the considerably longer selections. On the longer selections, all of the students read the same selection at the same time starting with the junior high school level material. An appropriate starting procedure appeared to be to read two selections at 405 words per minute followed by one selection at 450 words per minute. Rates were gradually increased up to a maximum of 540 words per minute. After the three timed controlled readings another selection was read in which students read and recorded their own rate. After each selection, students completed the comprehension questions which were later checked when the

instructor read the answers. Responses were discussed where it seemed advisable. Undoubtedly, the selections used are easier for some students than for others, however, none of the 15 students in the class appeared to have excessive difficulty with the material. (A variation is to have students work on selections of varying levels of difficulty and use answer keys or have reading lab personnel check answers.)

The texts mentioned above as well as other materials were purchased from funds collected over several quarters from students who in addition to their three credit hour tuition fee payed a one dollar lab fee. The texts remain in the lab and are used by many different students.

Transfer from speed drill work to more natural reading appears to be good, although understandably, maximum speed drill rates are not reached. Further, material used in DRSD is read for the purpose of comprehending well enough to answer questions over the material. Data are presented below concerning the class mentioned above.

Class Performance

Initial rate and comprehension were evaluated using a selection entitled "Boo" from Developing Reading Efficiency (publishers estimate the difficulty of "Boo" at junior high school level). The mean words per minute read was 216 with a standard deviation of 69. Rates ranged from 156 to 405 words per minute. Comprehension scores were much more consistent, with a mean of 81 percent with a standard deviation of 7 percent. Comprehension scores ranged from a 70 to 90 percent.

After the eight week session in which students worked through the DRSD procedures, students were tested with a selection entitled "The Student and the University" from Increasing Reading Efficiency (author's estimate at college sophomore level). On this more difficult selection the mean reading rate was 263 words per minute with a standard deviation of 53 words per minute. Rate ranged from 203 to 386 words per minute. The mean level of comprehension was 77 percent with a standard deviation of 14 percent. Comprehension scores ranged from 60 to 100 percent. Data are summarized in Table 1.

Table 1

Rate and Comprehension Data (N=15)

	Beginning Rate	Final Rate	Beginning Comp.%	Final Comp.%	
$\bar{X}$	216	263	81	77	$\bar{X}$
S.D.	69	53	7	14	S.D.
Range	156-405 (249 wpm)	203-386 (183 wpm)	70-90	60-100	Range

Comparison of data indicates that on the more difficult selection the students read more rapidly with a mean gain of 47 words per minute. The standard deviation of 53 words per minute indicates great variation in modification of reading rate. Rate changes ranged from a net loss of 51 words per minute to a net gain of 204 words per minute. The net loss occurred for one student who read the first selection at 270 words per minute and read the last one at 219 words per minute. The largest net

gain was recorded by a student who initially read at 182 words per minute and finished at 386 words per minute. Students appear to have adjusted rates accordingly to their perceived difficulty of the material. This probably accounts, in a large part, for the extremely wide variations in reading rate among class members.

What tends to be more informative, however, than the data presented above is an examination of weekly performance. Consistant increases in rate were apparent for most students while comprehension was usually maintained as they advanced to more difficult material.

Approximately half way through the course, one 7500 word selection was read (Chapter 6 from How to Study in College, Pauk, 1975) to estimate sustained reading rate. Students were advised that there would be no comprehension test after this material was read. This exercise was done to determine rate in a situation approaching normal reading circumstances. A mean rate of 260 words per minute was found with rates ranging from 221 to 325 words per minute. Much less variation (S.D. - 33 W.P.M.) was found when students read this longer selection.

Conclusions

Evaluation of the DRSD procedure indicates that it can provide the framework for improving rate while maintaining comprehension. There are many worthwhile materials for use with such a program. Numerous variations are possible which can be best determined through establishing goals based on student competencies and needs. This exploratory evaluation of DRSD suggests that much can be gained from further examination of the effective-

ness of procedures of this kind. For example, a comparison of lab procedures in which students largely set their own pace of rate gain could be compared with a forced rate system such as DRSD. Try getting DRSD for reading improvement!

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Appendix One

Date: _____	Date: _____	Date: _____	Date: _____	Date: _____
Level: _____	Level: _____	Level: _____	Level: _____	Level: _____
Sel.#: _____	Sel.#: _____	Sel.#: _____	Sel.#: _____	Sel.#: _____
Time: _____	Time: _____	Time: _____	Time: _____	Time: _____
WPM: _____	WPM: _____	WPM: _____	WPM: _____	WPM: _____
1. _____	1. _____	1. _____	1. _____	1. _____
2. _____	2. _____	2. _____	2. _____	2. _____
3. _____	3. _____	3. _____	3. _____	3. _____
4. _____	4. _____	4. _____	4. _____	4. _____
5. _____	5. _____	5. _____	5. _____	5. _____
6. _____	6. _____	6. _____	6. _____	6. _____
7. _____	7. _____	7. _____	7. _____	7. _____
8. _____	8. _____	8. _____	8. _____	8. _____
9. _____	9. _____	9. _____	9. _____	9. _____
10. _____	10. _____	10. _____	10. _____	10. _____
%	%	%	%	%

The Effects of Manipulating the Advance Organizer on Comprehension of Abstract Material

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For much of the past two decades numerous researchers have attempted to replicate the successes of Ausubel's initial studies regarding the notion and use of advance organizers (AO). From an analysis of AO studies, the current status might at best be described as confusing if not inconclusive (Barnes & Clawson, 1975; Faw & Waller, 1976; Hartley & Davies, 1976; Lawton & Wanska, 1977; Sledge, 1977). Many studies have included not only methodological, procedural and definitional criticisms, but also have attacked the theoretical based of the Advanced Organizer. With regard to the latter, Anderson, Spiro and Anderson (1978) suggest:

> From the perspective of recent formulations of schema theory, it is difficult to see why outlining subsequent material in abstract, inclusive terms should help readers. When the reader possesses relevant subsuming schemata, they will routinely be brought to bear, except when the passage is completely obscure.... But when the reader does not possess relevant schemata, there is no reason to suppose that they can be acquired from a few abstractly worded sentences (Anderson, 1977). We conclude that the theoretical justification for the advance organizer is quite flimsy. (p. 439)

As reflected in the above viewpoint, many attacks upon the AO often center around the problem of its operational definition (or apparent lack thereof). Unfortunately, many researchers may have overlooked Ausubel's later (1968) qualifications of his earlier explications of AO construction. For example, Ausubel (1968) states that "to be useful, however, organizers

themselves must obviously be learnable and must be stated in familiar terms" (p. 149), and that "to be maximally effective they must be formulated in terms of language and concepts already familiar to the learner, and use appropriate illustrations and analogies if developmentally necessary" (p. 311, italics ours). In fact, Ausubel (1968) suggests that elementary-level children would probably benefit more from AO's written at a lower level of abstraction than the subsequent material (p. 335).

Rationale

Considering that AO's are perhaps more than a "few abstractly worded sentences," the present study was designed to examine both Ausubel's suggestion that the use of AO's does not lend itself well to abstract material, and the contention by Anderson et al. that recent schema theory formulations undermine the theoretical justification of AO's.

Ausubel (1968) contents that organizers "facilitate the learning of factual material more than they do the learning of abstract material, since abstractions, in a sense, contain their own built-in organizers -- both for themselves and for related detailed items" (p. 149). He advises restricting the pedagogical use of organizers to substantially factual material. The problem remains that a large number of students, especially at the secondary level, have difficulty processing more sophisticated and abstract concepts which, at this level, are frequently thrust upon them (often with little regard for logical sequencing).

Rumelhart and Ortony (1978) suggest that one role of schemata is that of acting as a vehicle for inferential reasoning:

> ... one can regard the entire comprehension process in schema theory as itself being a case of analogical reasoning. When we determine that a situation fits a certain schema we are in a sense determining that the current situation is analogous to those situations from which the schema was originally derived. (p. 120)

Thus, in the current study it was theorized that it might be possible to create an expository AO that would serve as a relevant proximate subsumer, not at a superordinate level to provide anchorage for subsequent material, but rather one that, although subordinate, would serve to activate or utilize existing schemata or subsumers in order that the learner might better be able to construct the new schemata or "subsuming foci" (or remodel the old) necessary for the incorporation and retention of the target material. (Ausubel [1962, p. 222] relates Bartlett's view of schema to his own "subsuming foci" within his theory of subsumption.)

In order to assess the effect of this notion, a two-part AO was constructed: the first part (AAO_1) would provide that reader with an introduction to the second part, a "typically-constructed" AO, i.e., an AO written at a more abstract, general and inclusive level. This introduction (AAO_1) was written at a lower level of abstraction, and utilized a conceptual analogy familiar to all students.

An additional theorization was based on Thorndyke's (1977) research on memory for narrative discourse, in which the results suggested that "a priming effect or proactive facilitation occurred when the same structure was repeated in both stories.... The use of an already existing organization then facilitated learning relative to conditions in which a new structure had to be created" (p. 103). A second introduction (AAO_2) to

the AO was constructed, written structurally similar to the subsequent AO. Key conceptual words of the AO were replaced in AAO_2 by terminology more familiar to the student.

Procedure

The subjects were juniors and seniors in English classes in two public high schools in Tucson, Arizona. The instructional material, chosen from a high school American government textbook (McClenaghan, 1978), described four theories of the origin of the state. A "regular" AO was written for this passage, along with two introductory organizers, AAO_1 and AAO_2. AAO_1 (375 words), designed to be at a lower level of abstraction than the treatment passage and AO, utilized a conceptual analogy familiar to all students; specifically, it dealt with an analogy of the family, in which sources of authority in the family were discussed which directly paralleled the four theories of the origin of the authority of the state. AAO_2 (367 words) was written structurally similar to the AO. A buffer passage (314 words) for the control group merely discussed the term "state" in its various applications throughout history. All passages had readability estimates of 11th grade or lower, except the buffer passage which was 13.5 reading level.

Instrumentation used included a pretest of five multiple-choice questions buried with a 20-item test. The five questions covered the key concepts which would be presented in the treatment passage. The posttest consisted of 11 factual and 6 higher-level questions, and was used for

both immediate and delayed posttesting. It was shown to have a reliability coefficient of .81 by the Kudor-Richardson Formula No. 20 (Guilford & Fruchter, 1978).

A 3 x 2 ANOVA design was used, factors being AO (or none) and type of AAO ($_1$, $_2$, or none). Three hundred thirty-three subjects in 13 classes were pretested by classroom teachers for prior knowledge of the target material subject matter. Subjects were randomly assigned to each of the six treatment groups. One week after the pretest, the treatments, passages and immediate posttest were administered by the experimenters to 315 subjects. The delayed posttest was given to 264 subjects by classroom teachers one week after the immediate posttest. Cell sizes were equalized by random deletion when necessary.

Results

The pretest scores showed no significant differences among the treatment groups for prior knowledge of the material.

Scores on the immediate posttest showed no significant differences among treatment groups for main effects. Significant interaction was found, F (2, 300) = 3.82, $p < .05$. This significant interaction was found for both factual, F (2, 300) = 5.41, $p < .01$, and higher-level, F (2, 300) = 4.82, $p < .01$, questions. Additionally, the AAO condition was significant, F (2, 300) = 7.67, $p < .01$, for the set of factual questions alone. Analysis by the Scheffe method (Guilford & Fruchter, 1978) showed that the [AAO_1 + AO] and control groups (means of 11.25 and 11.24, respectively) performed significantly better than the [AAO_2 + AO] and [AAO_1 alone] groups (means of 9.65 and 9.51, respectively).

Scores on the delayed posttest showed no significant differences for main effects among treatment groups, nor was significant interaction found. Factual questions alone did show significant interaction; higher-level questions alone did not.

Discussion

Subjects' prior knowledge of the target material was low (60% scored at chance level or below on pretest).

In view of Ausubel's guidelines for constructing the AO (see above), the [AAO_1 + AO] treatment might be considered an "appropriately-constructed" AO, in that it incorporated concrete examples and analogies that may be necessary when the material is of an unfamiliar nature. The equivalent performance of this group with the control group may support Ausubel's idea (1968) that abstract material incorporates its own organizational properties (or instantiates the appropriate organizational schemata in the reader). That these two groups scored significantly better than some other manipulations of the AO indicates the necessity for a well-constructed AO, if an AO is to be used at all with abstract material.

The finding that the use of AAO_2 showed no statistically significant difference is of interest. The notion that repeated structure would enhance comprehension (from Thorndyke, 1977) was applied to the AO, but it appears that if the transfer of schematic structure from a familiar to a more abstract AO does occur, it has no apparent effect on comprehension of a subsequent passage. AAO_2 made the context of the AO more familiar, but the concept (sources of power/authority) was still abstract.

The finding that [AAO_1 + AO] appeared to make a difference compared to [AAO_2 + AO] generates a discussion of differences between these two treatments. Both AAO_1 and AAO_2 introductions to the AO were written to be more familiar in subject matter to the subjects. AAO_1 was analogous to the target material, while the structure transfer attempted by AAO_2 was directed toward the AO itself. It appears that concrete examples should be analogous to the target material itself, not the AO.

Limitations

Possible limitations of this study may constrict the generalizability of some of the findings. Verbal ability was not ascertained and isolated as a moderator variable. The posttests should have included more higher-level questions in order to better show any real differences between groups. The immediate posttest may not have reflected actual classroom practice. A delayed posttest after a lengthier interval may have better reflected long-term retention. The difficulty and nature of the buffer passage may have unintentionally activated those subjects' schemata more than the other groups for learning abstract, unfamiliar material. Finally, the single treatment passage limits generalizability: variations in the length, cohesiveness and level of abstraction of the material to be learned would likely affect the outcome.

Implications/Recommendations

The results of this study provide a number of implications for further research on the advance organizer. Prior knowledge should be considered as an independent variable; the efficiency of AO's cannot be determined

without estimating whether or not appropriate subsumers exist within the learner's cognitive structure for processing unfamiliar, abstract material. The variable of verbal ability should also be considered, as subjects measuring high on this attribute may have better internalized the process of activating schemata prior to or concurrent with the reading task.

Certain characteristics of the text should be reported, including type of organization, level of abstraction and cohesiveness. Text analysis would also help to provide researchers with a basis for formulating their questions, e.g., utilizing those concepts and propositions deemed critical to understanding the author's message. Text analysis should also facilitate the construction of different types of AO's, along with interpretation and generalizability of results.

Although attempts have been made to answer many of the methodological and definitional criticisms of AO theory and research (Ausubel, 1978; Lawton & Wanska, 1977), further effort is needed in attempting to generate some consensus on applicable, workable definitions of AO's as they are used in different ways for different purposes, types of materials, and characteristics of the learners.

Finally, perhaps an analytical comparison of similar aspects of schema and subsumption theories and how each may complement the other would provide researchers with a more solid "ideational scaffolding" from which to better formulate effective instructional strategies.

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Predicting Reading Ability Through Language Experience:

The Language Sample Survey (LSS)

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A major concern in education today is in the use of printed instructional materials which are inappropriate for the reading ability level of the student. In order to provide suitable instruction in all academic areas, teachers need a quick and reliable way to determine their students' reading grade levels. Traditionally, the classroom teacher has had to rely on previously administered standardized tests as the basis for assigning appropriate instructional materials. Unfortunately, standardized reading tests are not administered at each grade level and current test data are thus not always available for use by the classroom teacher.

A similar situation exists in business and industry. Personnel officers frequently have the responsibility of hiring the best qualified individual from a list of apparently equally educated applicants. Where literacy level may be an important consideration, and even if it is not; past records, recommendations, a personal interview, and perhaps even a standardized reading test may not provide the best discriminatory data. Quite often the stigma or anxiety associated with a conventional "reading test" or any "test", particularly where employment is concerned, may completely obfuscate the reliability of such instruments.

The feasibility of using writing samples of students as means of assessing their reading ability levels was examined in a dissertational study (Lazdowski, 1976) submitted to the graduate school of New Mexico State University. Three hundred thirty-eight samples were collected from junior high, senior high and college students, with measured reading ability levels from grades three to fourteen, in El Paso, Texas and Las Cruces, New Mexico. Reading ability grade levels were predetermined for each sample writer using standardized tests such as the Nelson-Denny Reading Test, the Nelson Reading Test, California Achievement Test and the San Diego Quick Assessment. The results were further verified by personal evaluations of qualified reading teachers who had been working with the students. Only those samples were used where the results of the standardized tests agreed with the evaluations of the reading teachers. This was done to insure that the predetermined reading grade levels of the sample writers would be as accurate as possible.

The following readability formulas were applied to each of the writing samples:

1. Dale-Chall Readability Formula (1948)
2. Farley Readability Formula (1975)
3. Flesch Reading Ease Formula (1952)
4. Fry Readability Graph (1968)
5. Gunning Fog Index (1968)
6. Lorge Readability Formula (1959)

7. Spache Readability Formula (1974)

8. Sticht Readability Index, FORCAST (1974)

The results were compared with each subject's achieved reading level to determine whether significant correlations existed between the measured reading ability and the formula-computed readability levels of the samples.

One hundred twenty of the samples, selected randomly, were further analyzed according to the following criteria in an effort to identify a correspondence between writing and reading achievement:

1. Vocabulary Load, including difficulty and diversity.
2. Sentence Structure, as indicated by the percentage of simple sentences and by the average length in terms of letters, syllables and words.
3. Density of Ideas, as indicated both by the number of different words and the total number of content words used. (DeVito, 1965)
4. Syntactical Complexity in accordance with the Developmental Sentence Scoring criteria developed by Lee and Canter. (Lee and Canter, 1971)
5. The ratio of T-Units (thought units) to the total number of letters, sentences, clauses of phrases, words and syllables. T-Units, devised by the author, are individual thoughts or ideas expressed within the passage.

Of the four criteria, the last (T-Units) may need further explanation. Hunt used the term, "T-units" (with a small "u" in "units") in 1965, saying that:

> A T-unit is a main clause plus any subordinate clause or non-clausal structure that is attached to or embedded within it. It is grammatically allowable to punctuate any T-unit as a sentence. And T-units are the shortest segments that it is allowable to punctuate in this way without creating fragments in between. The term, "T-units" is short for "MINIMAL TERMINABLE UNITS". (Hunt, 1965)

Jurgens and Griffen described the T-unit as a "convenient term to label what is commonly called a simple or complex sentence. "Compound or compound-complex sentences are composed of two or more T-units." (Jurgens and Griffen, 1970)

The T-Unit (with a capital "U" in "Units"), as it is used here, refers to a measuring device modified by the author from an eclectic compilation of several research studies. T-Units, or "thought units" are actually isolated ideas which are contained in all written material. T-Units, in contrast with sentences, phrases and clauses, are not bound by punctuation rules of any kind. They may be manifested in a single word, expression, phrase, clause, a complete sentence, or possibly an entire paragraph. Two distinct values of T-Units to the total number of words were computed initially. A third T-Unit relationship, with syllables,

was used in the formula. In the following sentence, there is a total of three T-Units:

I would like to go to Rome to see the Coliseum.

I would like (1)

to go to Rome (2)

to see the Coliseum (3)

Eleven words are contained in the sentence. The ratios are:

1. The ratio of T-Units to the sentence, which is 3/1 or 3.0.
2. The ratio of T-Units to the total number of words, which is 3/11 or .273.

An average sentence ratio was computed for each of the samples. For the second computation, the number of T-Units to the total number of words in each sample was used. The results are listed in Table 1. Note that as the reading ability grade level is increased, both T-Unit ratios decreased. This inverse relationship appears logical in that more complex sentences use more words to express fewer thoughts.

As a further illustration of how the T-Unit ratio serves in the identification of the reading grade level of the sample writer, the sentence used in the example may be used with the values taken from Table 1. The sample writer's actual reading grade level (this sentence was taken intact from one of the writing samples used in the study) was predetermined to be grade level 5.5. The sentence ratio of 3.0 corresponds to approximately grade 7 in Table 1. The word ratio of .273 indicates approximately grade

TABLE 1

T-Units Ratios

Grade	T-Unit/Sentence	T-Unit/Words
5	3.5	.274
6	3.2	.195
7	3.0	.185
8	2.8	.175
9	2.6	.166
10	2.4	..154
11	2.2	.144
12	2.0	.130
13	1.8	.122

The figures represent mean scores computed at each reading ability category for the writing samples used in the study.

5 (.274 in Table 1). Using both of the ratios together would indicate a predicted reading ability grade level of 5-7, which is fairly close to the actual reading ability grade level of this particular sample writer.

Neither academic grade levels nor chronological ages of the sample writers were considered. Subjects were from grades seven through thirteen (college freshman). Reading ability ranged from less than third grade to beyond grade fourteen. The writing samples were categorized according to reading levels without regard to academic grade levels or ages of the subjects. Subjects came from a diversified background both economically and culturally. These factors were not considered in either the selection or categorization.

Each subject was asked to write at least fifty words on either of the following topics:

"What I would like to do on my next vacation," or

"What I did on my last vacation."

The papers were identified and categorized according to the predetermined reading ability grade levels of the subjects and analyzed using the criteria previously mentioned.

The principle hypothesis of the study proposed the existence of a relationship between writing ability and reading achievement. A second hypothesis, or correlate, stated that not only did this relationship exist but also that the degree of proficiency in writing ability reflected a corresponding degree of proficiency in reading. These relationships were clearly indicated through the application of the eight readability formu-

las. Mean readability scores for each of the categories were compared with the subjects' actual reading ability levels for each of the formulas using Pearson's Product Moment of Correlation (Pearson's r). Coefficients of correlation ranged from an r = .82 for the Spache formula to an r = .99 for the Lorge application. While the mean raw score correlations were significant ($p. < .001$), the dispersion of individual raw scores within each grade level category appeared to be too diverse for most of the formulas to be usable in predicting reading achievement within one grade level with an acceptable degree of reliability. The Fry and Lorge formulas were selected for further statistical analysis because their results indicated the least amount of dispersion.

The Language Sample Survey (LSS) was developed by means of a stepwise multiple regression equation using the most likely predictors found in both the readability formulas and the syntactical analysis. The derived formula using these factors found to be most reliable, is as follows:

$$P.R.L. = 2.34 + .25 \left(\frac{SYLL}{T\text{-}Units}\right) + .2\ (ASL) + 2.5 \left(\frac{PSW}{S}\right)$$

Where:

P.R.L.	=	Predicted reading ability grade level
SYLL	=	Total number of syllables (as they are pronounced) in the passage of at least fifty words.
T-Units	=	Tally of the number of individual thought units in the passage
ASL	=	Average sentence length

PSW = All word tokens (words, non-words, numerals, dates, abbreviations, acronyms) as they are pronounced having three or more syllables.

S = Number of sentences in the passage.

The LSS accurately predicted the reading ability grade levels of the subjects within one grade level in ninety-five percent of the cases checked (N=1500) and within two grade levels in ninety-nine percent of the cases.

The results of the evaluation of syntactical complexity using the inherent criteria reinforced the findings of the readability formulas. Several other indicators of a positive relationship were identified. More mature readers used simple sentences with greater frequency than did their less skilled peers. This may seem somewhat startling initially but was in agreement with the findings of De Vito, 1965 and Walcott, Lamport and McCracken. (Walcott, Lamport and McCracken, 1974) Better readers employed the definite article "the" more often which tended to improve fluency and they generally included longer and more difficult words in their writings. An increase in the use of complex sentences over compound sentences was also observed in the upper grade levels of reading ability. Finally, the passages written by those with superior reading ability were notably more cohesive and unified.

Word count measures proved to be the most appropriate devices for determining complexity. The average length of words in terms of letters and syllables contrasted greatly at the two extremes (high and low reading

ability). Only slight length changes were found, however, between adjacent grade levels. An increase in the use of difficult words (those having three or more syllables) was obvious as the reading ability levels increased even though this did not occur sequentially.

The dominance of simple sentences was a noted characteristic in the upper levels. In the lower grades (4-8), coordinated clauses connected by "and" were most frequent, usually with strings of independent sentences rather than clauses. Some of the passages examined in the lower grade level categories consisted of a single long strungout sentence.

In the application of the Developmental Sentence Scoring (DSS) criteria, a distinctive progression was found in successive reading ability grade levels. This progression, along with the progressions achieved by the readability formula applications, conclusively demonstrated the existence of a positive link between the two communication skills of reading and writing.

The conclusions reached in this study portend the beginning of what could be an expanding field of research and study. The paucity of related research, found in this area, seems to indicate an endemic need to investigate this relationship more thoroughly. If a relationship such as this can be affirmed, then what of similar propinquities between other communication skill pairs? Is there, perhaps, a homology existing among all four---reading, writing, speaking, and listening?

Determining reading ability of an individual through an analysis of his writing capacity is probably of greatest significance. Both are

internally self-generated skills, whose relationship is not derived nor based upon some externally devised norms but rather on the language and experience of the individual. Results and their interpretation are not affected by any outside bias or testing restrictions.

The LSS was conceived using this very concept. It is an instrument which may be used in a variety of situations both simply and effectively. A ten-step procedure was developed to follow the application. These ten steps are as follows:

1. Tally the T-Units
2. Count the number of syllables as they are pronounced
3. Divide the results of step 2 by step 1
4. Multiply the results of step 3 by .25
5. Find the average sentence length (ASL)
   a. Count the total number of word tokens (word tokens include all words, non-words, acronyms, abbreviations, numerals, dates, etc.)
   b. Count the number of sentences
   c. Divide the step 5a by step 5b
6. Multiply the results of 5c by .2
7. Count the number of word tokens having three or more syllables as they are pronounced
8. Divide the results of step 7 by step 5b
9. Multiply the results of step 8 by 2.5
10. Add together the results of step 4, step 6 and step 9 with the constant 2.34. The sum is the predicted reading ability grade level of the sample writer. (PRL)

In his study, Johnson found similar corresponding data between writing ability and reading achievement. (Johnson, 1975) A feature story in Newsweek focused on this same relationship. (Sheils, 1975)

One gnawing obstacle encountered in the study, which persisted in several of the evaluative processes was an obvious dispersion of raw scores within the grade levels. This dispersion could have been attributed to some confounding, yet uncontrollable factors. The reliability of the standardized tests used and possibly the personal (subjective) evaluations of the reading teachers, which established the original grade level categories, could be questioned even though stringent measures were taken to achieve reliability. The transcendent non-empirical concept of "grade level" in terms of reading ability, is another source of much heated discussion among educators. The professed reliability of the readability formulas used in the measurement of the samples could have also contributed to the dispersion.

All these factors have been considered during the conduct of the study and in the subsequent evaluation of the instrument. Despite these obstacles, it is felt that the LSS is a viable measuring instrument when used for the purpose for which it is intended.

The LSS has been used by teachers in classrooms across the country primarily as a screening device for the past three years with satisfactory results. Using the 10-step procedure, it takes about 3-5 minutes to score (about the same amount of time as it takes to correct a composition paper). Follow-up studies have revealed that the subject of the written samples

is unimportant. What should be stressed, however, is that the sample be as close as possible to the student's informal speech pattern. Any papers which are written "for grades" or which are edited in any way will invalidate the LSS. One teacher reported that she had the best results with using the LSS on "student notes", those which kids frequently exchange in the classroom.

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